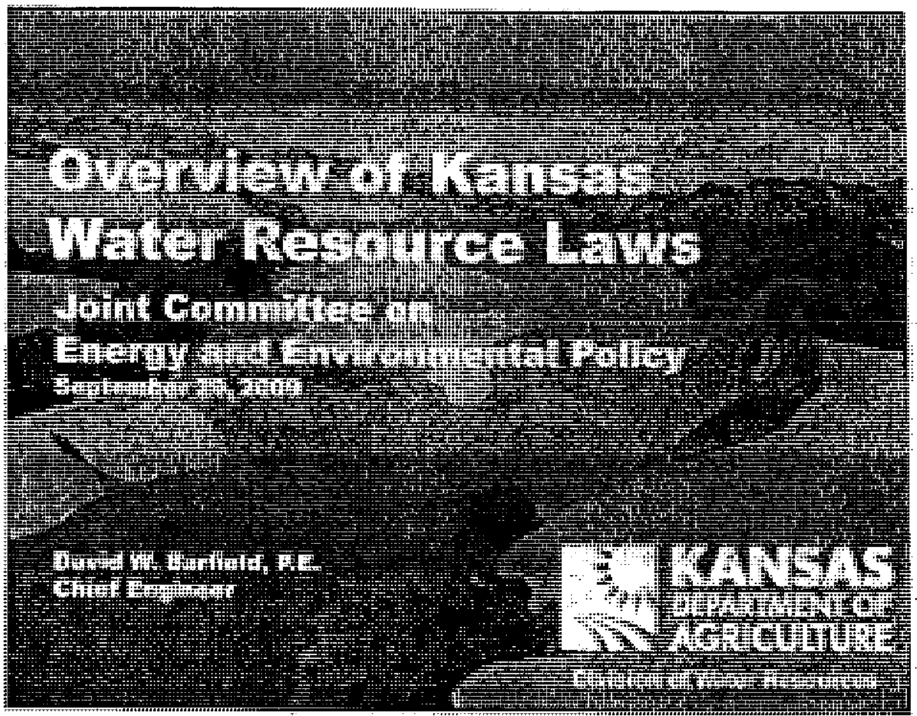
Exhibit 3



Outline

- Overview of the state's water resources
- Kansas Water Appropriation Act
- Amendments to the Water Appropriation Act and new laws
- Looking to the future

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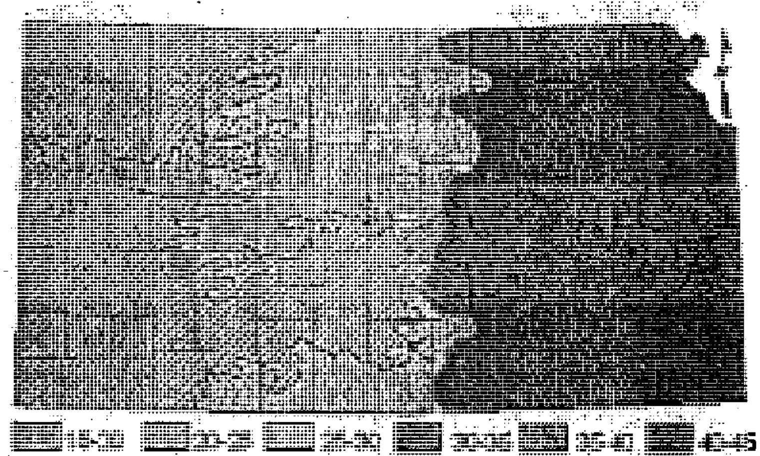
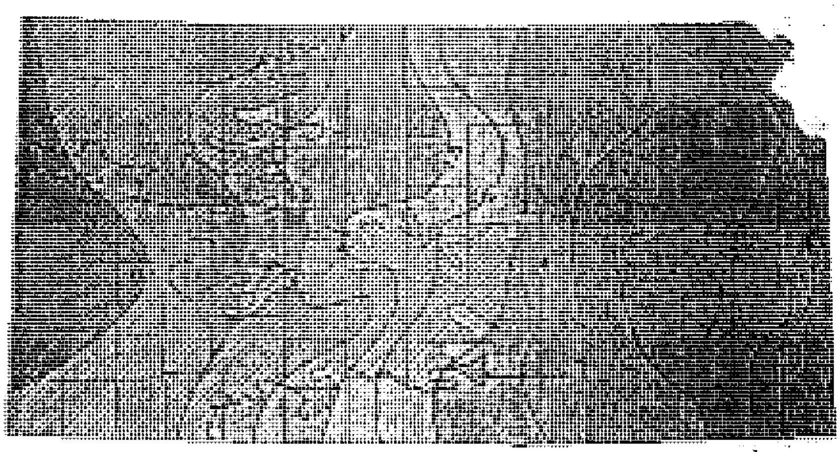
Normal Annual Precipitation



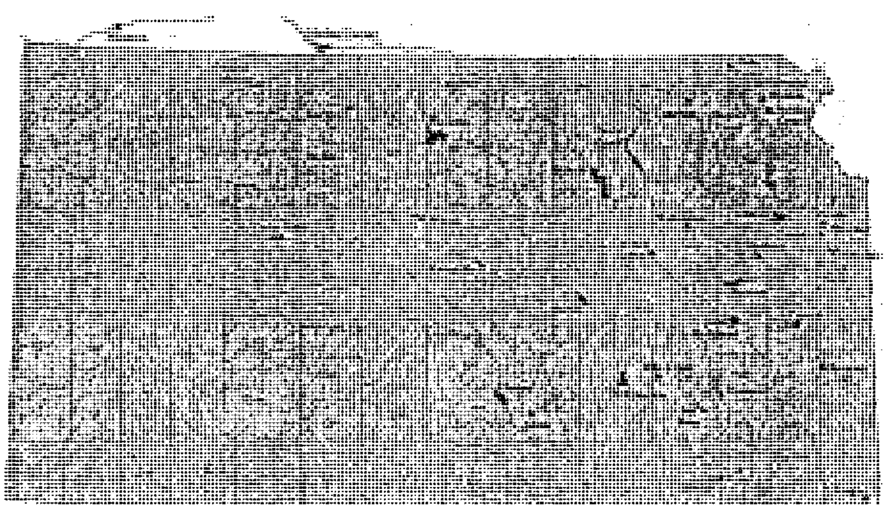
The area west of the dashed line shows the extent of the High Plains aquifer in Kansas (from Goodin et al., 1995)

Average Annual Runoff (Inches)



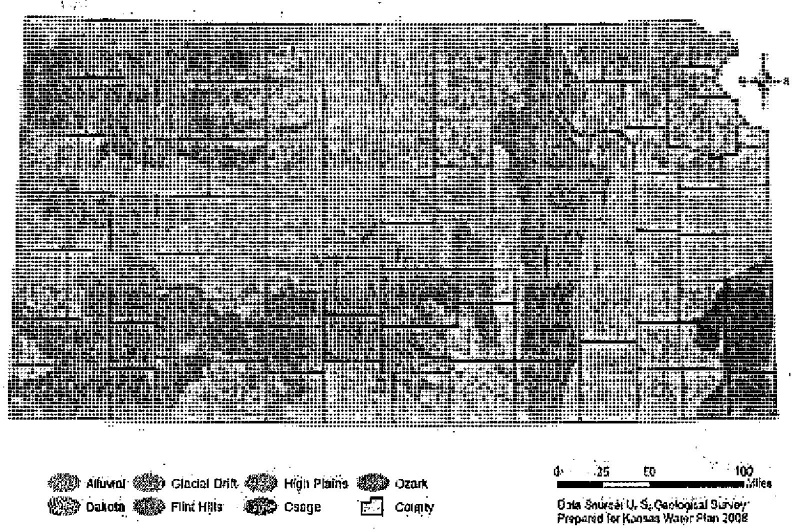
The areas west of the dashed line shows the extent of the High Plains aquifer in Kansas (adapted from Wetter, 1987).

Reservoirs in Kansas



Groundwater Supplies

Major Kansas Aquifers



Kansas Water Appropriation Act (1945)

- All water dedicated to use by Kansans
- Right to use water is based on Prior Appropriation or "First in time, First in Right"
- Limits rights to reasonable needs
- Allocated for beneficial use and to protect minimum desirable streamflows
- Protects investments, property rights and the resource

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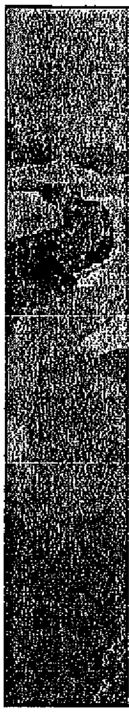

Water Appropriation Act

- Single priority system for groundwater and surface water
- A "water right" is not to the ownership of water, but it is a real property right to divert and use water for beneficial purposes with certain limitations
- Domestic use allowed without a permit

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Water Administration

- Chief Engineer is charged with administering the act
  - K.S.A. 82a-706: The Chief Engineer shall enforce and administer the laws of this state pertaining to the beneficial use of water and shall control, conserve, regulate, allot and aid in the distribution of the water resources of the state for the benefits and beneficial uses of all its inhabitants in accordance with the rights of priority of appropriation.

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Water Administration

- During periods of shortage, junior water rights may be curtailed to satisfy senior rights and minimum desirable streamflow
- Releases from storage protected

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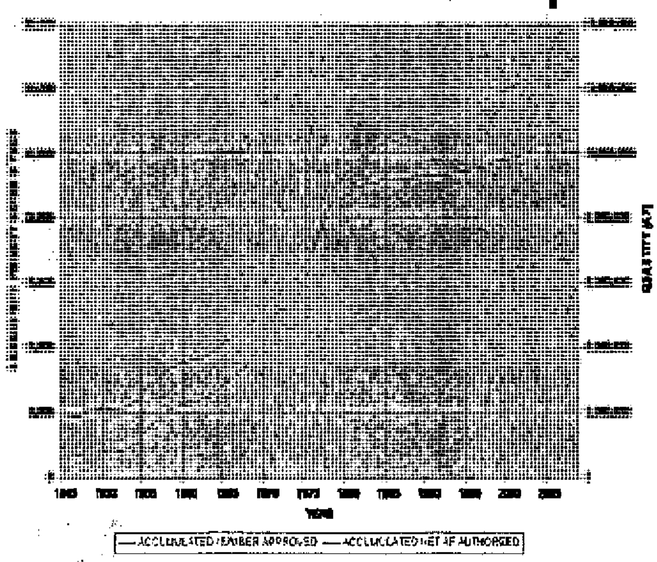
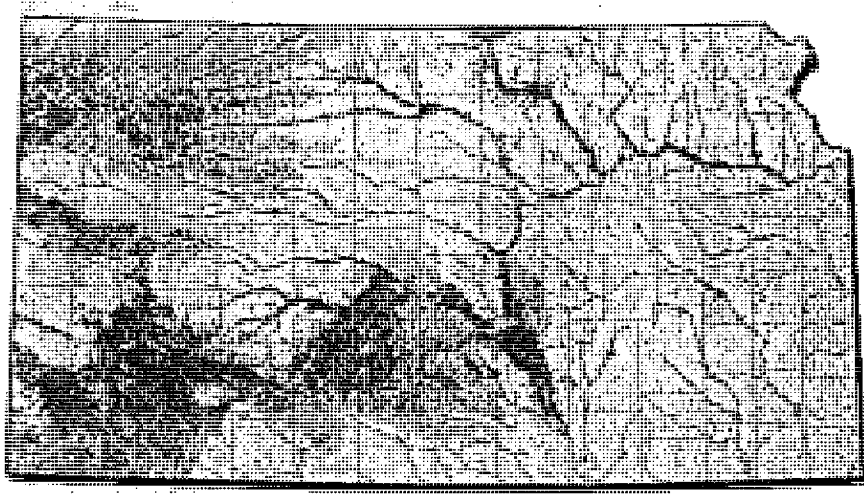
Water Resource Development

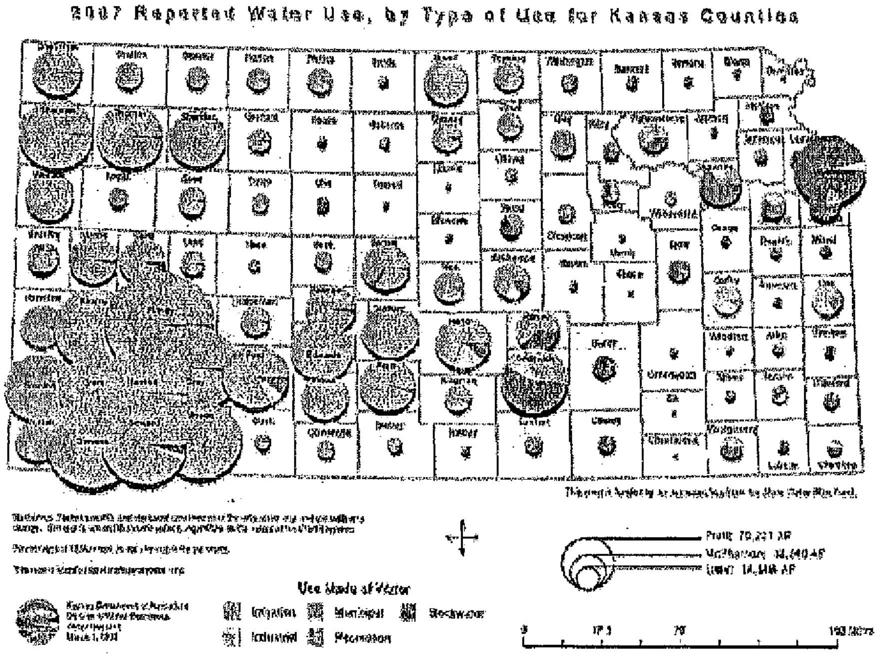


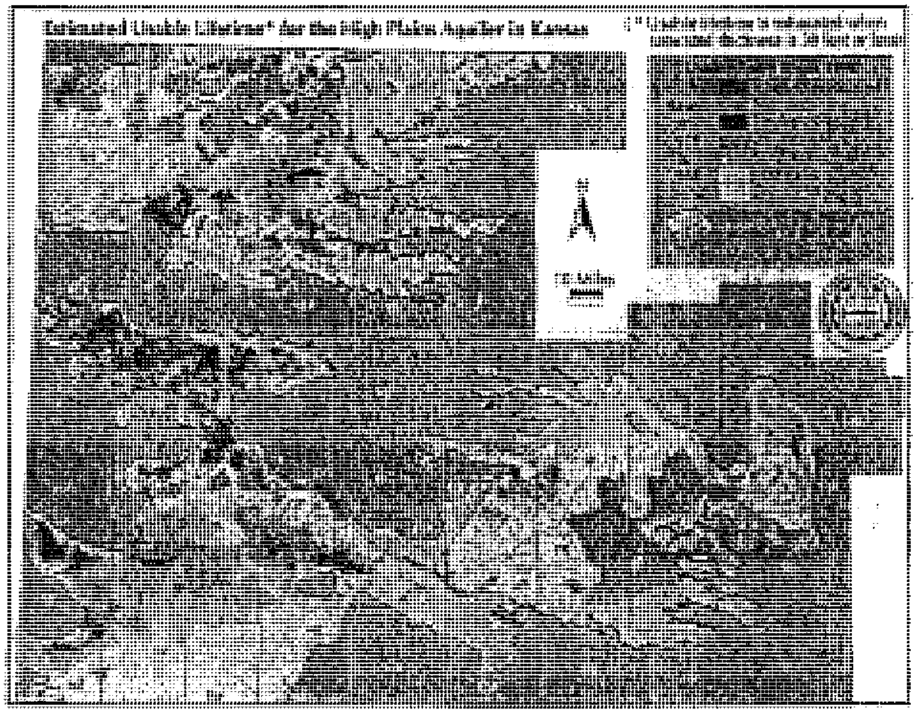
Accumulated number of water rights and authorized quantities.

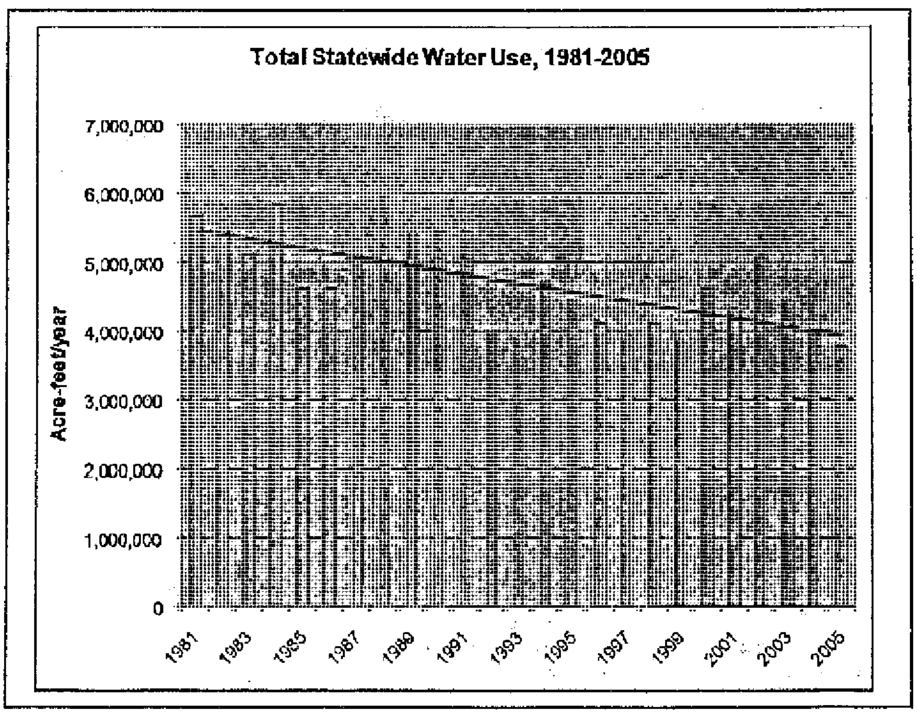
Diversion Points



2007 Reported Water Use, by Type of Use for Kansas Counties






Total Statewide Water Use, 1981-2005
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
Acre-feet/year
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005

Water Availability

- In areas closed to new water rights, additional water use for population growth or new industry can only be accommodated through purchase and conversion of existing water rights
- Changes must pertain to the same local source of supply
- Changes from irrigation to another use such as municipal must not increase consumptive use

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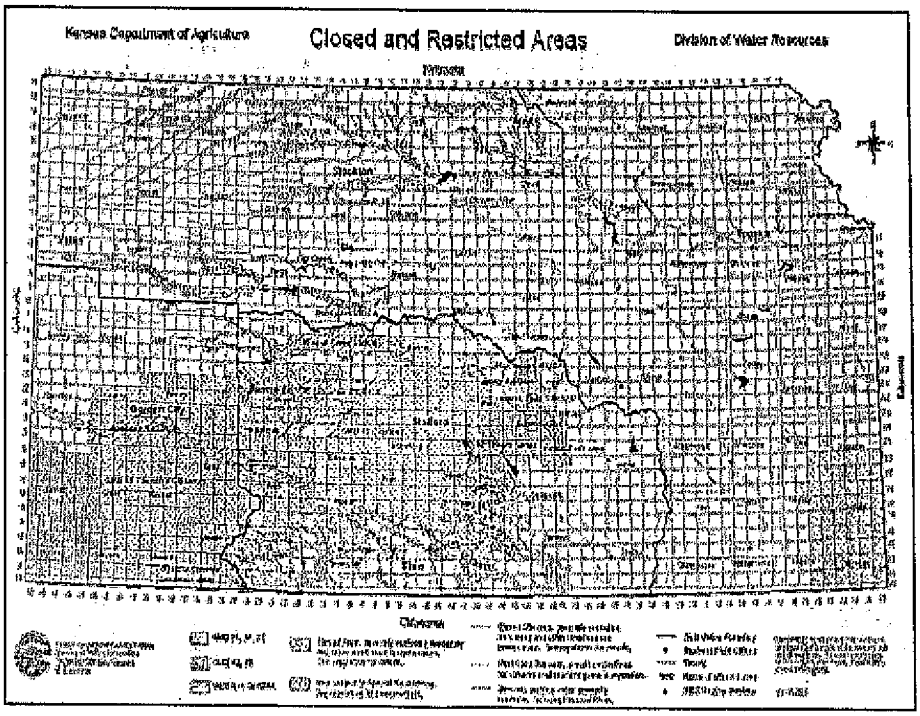

Water Law Changes

Year	Updates to Water Laws
1973	Groundwater Management District Act
1978	KWAA amended to require water rights for all non-domestic uses
1978	GMD Act amended, IGUCA provision added
Early 1980s	Significant new restrictions for new water rights (e.g., safe yield)
1984	Minimum desirable streamflows established
1989	Water use reporting improved via penalties for failure to report
2000	Significant new KWAA regulations

2009 - IGUCA Process
Pawnee R. Basin

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2009/10
x Closed GMD #1
x meters

Groundwater Management District Act

- Allows local control of groundwater policy within the bounds of state law
- Water users and landowners vote; Board elected and local funding
- Must adopt management program
- May recommend rules and regs, as well as IGUCAs
- The Chief Engineer must approve management plan and ensure policies do not conflict with the basic laws of the state

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Water-Level Changes in the High Plains Aquifer, Predevelopment to 2009, 2007–08, and 2008–09, and Change in Water in Storage, Predevelopment to 2009

By V. L. McGuire

Groundwater Resources Program

Scientific Investigations Report 2011–5089

U.S. Department of the Interior
U.S. Geological Survey

U.S. Department of the Interior
KEN SALAZAR, Secretary

U.S. Geological Survey
Marcia K. McNutt, Director

U.S. Geological Survey, Reston, Virginia: 2011
Revised December 2011

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Acknowledgments

The water-level data used in this report were provided by the following entities through data files or downloads from web sites and loaded into the U.S. Geological Survey National Water Information System:

- Colorado: Division of Water Resources (also known as the Office of the State Engineer);
- Kansas: Department of Agriculture—Division of Water Resources and Kansas Geological Survey;
- Nebraska: Central Nebraska Public Power and Irrigation District, Natural Resources Districts, and University of Nebraska—Lincoln, Conservation and Survey Division;
- New Mexico: Office of the State Engineer;
- Oklahoma: Water Resources Board;
- South Dakota: Department of Environment and Natural Resources;
- Texas: Groundwater Conservation Districts and the Water Development Board;
- Wyoming: State Engineer's Office;
- Bureau of Reclamation, U.S. Fish and Wildlife Service; and
- U.S. Geological Survey offices in Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming.

The author thanks the above entities for providing the water-level data and for their responsiveness regarding questions about the data.

Contents

Figures

Tables

Conversion Factors

Inch/Pound to SI

Multiply	By	To obtain
	Length	
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
acre	4,047	square meter (m^2)
square foot (ft^2)	.09290	square meter (m^2)
square mile (mi^2)*	2.590	square kilometer (km^2)
	Volume	
gallon (gal)	3.785	liter (L)
gallon (gal)	.003785	cubic meter (m^3)
cubic foot (ft^3)	.02832	cubic meter (m^3)
acre-foot (acre-ft)**	1,233	cubic meter (m^3)

*There are 640 acres in a square mile (mi^2).

**One acre-foot of water is equivalent to the volume of water that would cover one acre (43,560 ft^2) to a depth of 1 foot (325,851 gallons or 43,560 ft^3).

Vertical coordinate information is referenced to the National Geodetic Vertical Datum of 1929 (NGVD 29).

Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

Altitude, as used in this report, refers to distance above the vertical datum.

Water-Level Changes in the High Plains Aquifer, Predevelopment to 2009, 2007–08, and 2008–09, and Change in Water in Storage, Predevelopment to 2009

By V.L. McGuire

Abstract

The High Plains aquifer underlies 111.8 million acres (175,000 square miles) in parts of eight States—Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming. Water-level declines began in parts of the High Plains aquifer soon after the beginning of substantial irrigation with groundwater in the aquifer area. This report presents water-level changes in the High Plains aquifer from the time before substantial groundwater irrigation development had occurred (about 1950 and termed "predevelopment" in this report) to 2009, from 2007–08, and from 2008–09. The report also presents change in water in storage in the aquifer, from predevelopment to 2009.

Ninety-nine percent of the water-level changes from predevelopment to 2009 ranged from a rise of 41 feet to a decline of 178 feet. The area-weighted, average water-level changes in the aquifer were a decline of 14.0 feet from predevelopment to 2009, a decline of 0.1 foot from 2007–08, and a decline of 0.3 foot from 2008–09. Total water in storage in the aquifer in 2009 was about 2.9 billion acre-feet, which was a decline of about 273 million acre-feet since predevelopment.

Introduction

The High Plains aquifer underlies 111.8 million acres (175,000 square miles (mi^2)) in parts of eight States—Colorado, Kansas, Nebraska, New Mexico, Oklahoma, South Dakota, Texas, and Wyoming (fig. 1; Qi, 2010). The water generally occurs under unconfined conditions in the aquifer and the water body, from a regional perspective, has a water table at which the water pressure is atmospheric (Weeks and Gutentag, 1981). The saturated thickness of the aquifer, which is the distance from the water table to the base of the aquifer, ranges from less than 50 feet (ft) to about 1,200 ft (McGuire and others, 2003). Gutentag and others (1984) reported that, in a few parts of the aquifer area, the water table is discontinuous; these areas are labeled as "areas of little or no saturated thickness" in figure 1. Wells drilled in areas of little or no saturated thickness (see fig. 8 in Gutentag and others, 1984) likely will not yield water unless the well penetrated saturated sediment in either buried channels or depressions in the bedrock. The aquifer is classified into three regional subdivisions—Northern, Central, and Southern High Plains; there is little groundwater flow in the aquifer between the regional subdivisions (fig. 1; Weeks and others, 1988).

The area overlying the High Plains aquifer is one of the primary agricultural regions in the Nation; in parts of the area, farmers and ranchers began extensive use of groundwater for irrigation in the 1930s and 1940s. Estimated irrigated acreage in the area overlying the High Plains aquifer, which increased from 1940 to 1980, did not change greatly from 1980 to 2005: 1949—2.1 million acres, 1980—13.7 million acres, 1997—13.9 million acres, 2002—12.7 million acres, 2005—15.5 million acres (Heimes and Luckey, 1982; Thelin and Heimes, 1987; U.S. Department of Agriculture, 1999 and 2004; Kenny and others, 2009). In 2005, irrigated acres overlaid 14 percent of the aquifer area, not including the areas with little or no saturated thickness (Kenny and others, 2009).

About every 5 years, groundwater withdrawals for irrigation and other uses are compiled from water-use data and reported by the U.S. Geological Survey (USGS) and State agencies. Groundwater withdrawals from the High Plains aquifer for irrigation increased from 4 to 19 million acre-feet (acre-ft) from 1949 to 1974; groundwater withdrawals for irrigation in 1980, 1985, 1990, and 1995 were 4 to 18 percent less than withdrawals for irrigation in 1974 (Heimes and Luckey, 1982; U.S. Geological Survey, 2008). Groundwater withdrawals from the aquifer for irrigation were 21 million acre-ft in 2000 and 19 million acre-ft in 2005 (Maupin and Barber, 2005; U.S. Geological Survey, 2008; Kenny and others, 2009).

Water-level declines began in parts of the High Plains aquifer soon after the onset of substantial irrigation using groundwater—about 1950 (Gutentag and others, 1984). By 1980, water levels in the High Plains aquifer in parts of Texas, Oklahoma, and southwestern Kansas had declined more than 100 ft (Luckey and others, 1981).

Long-term water-level changes in the aquifer result from an imbalance between discharge and recharge. Discharge from the High Plains aquifer primarily consists of groundwater